# Architecture of the Great Charity Hospital

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Avery

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# ARCHITECTURE OF THE GREAT CHARITY HOSPITAL *

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The large charity hospital, which must handle a great many patients at the least possible cost and give them the largest possible measure of intelligent care, should be arranged architecturally so that the physicians, nurses and the common employees can do the greatest amount of work with the least expenditure of time and energy.

These principles have guided most hospital architects and the difference in the arrangement of these great plants in different institutions is due to the valuation by architects of the respective services.

I shall try to picture the ideal institution of this character:

1. The administration department is naturally the gateway to such an institution; it is,therefore, the first building that we enter; the offices are there; the information bureau is there; all business with the outside world is conducted there. It should therefore be convenient to reach.

2. A division of the administration department of the institution is the admission bureau with its examination rooms, its dispensary, or outpatient department, its baths for the admission of patients, its clothes-lockers, and, since all clothing must be sterilized before it is put away, its clothing sterilizer. This business of sterilization is quite a technical one under modern-day methods, including the handling of steam machinery, and should be in the hands of experts. Dressings of all sorts and various materials that go to the operating-rooms and to

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the surgical dressing-rooms must be sterilized. These materials must go to all units of the hospital, however many there are and wherever located, and it would seem an ideal arrangement to have the whole sterilization plant at one place where it could be under the control of people who are doing nothing else but that work, so that it will be done expeditiously, economically and methodically. Thus, the whole sterilization plant would become a unit of this admission bureau.

3. The stores of the hospital, whether papers of pins or cars of coal, must be receipted for by the responsible storekeeper, and these stores are subsequently distributed to all parts of the institution. It would seem, therefore, a good plan to have the storekeeper's office and his store-rooms located at some central point, and as that officer is a part of the business administration of the institution he belongs somewhere in the neighborhood of the administration bureau.

4. Modern humanitarianism is demanding more and more all the time for the convenience, comfort and care of those unfortunate members of society who cannot help themselves, and especially is this true of the sick poor. One of the greatest factors in the comfort of these people is good food, properly, quickly and intelligently served. This means that things which should be hot should reach the patient hot, and things which are intended to be served cold should reach him while they are still cold. We have already suggested that the stores should be at a central point for better distribution, meaning ice, milk and vegetables, as well as the surgical and medical supplies and the household materials, and if to keep these stores at a central point it will add materially to the economical administration of the institution if we have the kitchen and serving-rooms near by.

We have, therefore, another unit added to those which I propose to locate centrally. In many places, especially in the large institutions of Germany, steam or electric trains carry the food from some remotely located kitchen to the various points of distribution in the wards. Experience has taught us that, while these trains are economical and efficient, as to the physical work of transporting food, they are not entirely satisfactory from the point of view of the patient, as the food does not reach the sick in an appetizing and palatable condition. It would seem that a better plan would be to have the kitchen so centrally located that the food could be rushed in an appetizing condition to even the remotest point of distribution.

5. The pathologic department of an institution has come to be recognized as one of its most important factors. The morgue is a part of this unit, with ice-boxes, necropsy rooms, which should be well lighted and comfortable as to temperature and ventilation, and, if there are students to be thought of, and especially if there is a school connected with the institution, a small, well-arranged amphitheater. As all dead bodies are brought to the morgue, it becomes necessary to place on view there the unidentified dead; for this reason a chapel also becomes a part of the pathologic unit, in which services can be held over the dead; this is especially necessary with the poor, who are the sole patrons of these institutions. Many of these cases must be passed on by the coroner; therefore, there must be an inquest-room with witness-rooms adjoining. There are perhaps some objections to having all this array of rooms in direct connection with the laboratory of pathology, but it is inconceivable that the morgue and necropsy rooms should be at a distance from the pathologic department when, as a matter of fact, the moment that breath leaves a human body that body at once becomes a pathologic specimen and, when a necropsy is to be done, is turned over to the pathologists, and since where the dead body is, there must also be the coroner, his witnesses and jurors and the chapel for the last rites for the dead.

In this day most large institutions are fitted in the various units with small auxiliary laboratories in which the simpler pathologic procedures, such as urinalysis, blood-counts, blood-pressures and smears of various sorts identified under the microscope, can be carried on. Many of the simple procedures, however, become complicated at certain stages and the facilities and perhaps the more expert knowledge of the central laboratory must be invoked for an efficient settlement of mooted questions. The central laboratory should, therefore, be so located as to afford ease of access from the auxiliary laboratories in the various units of the institution. Then, too, there are vaccines to be given which are kept in the refrigerators of the central laboratory because the conditions under which they must be kept are exacting and their repository must be carefully watched for correct temperatures. There are autovaccines to be made; these autovaccines must be incubated under carefully directed conditions, in carefully regulated incubators, and the technic of their preparation is most exacting; hence they are always made in the central laboratory. There are serums to be prepared and administered in almost every unit of a general hospital. In the children's department, in the lying-in bureau, in the surgical and medical wards and in the infectious disease quarters, as for instance, the antimeningitis serum and the diphtheria antitoxins.

One can see how necessary it is, therefore, that the pathologic department shall be centrally located to save time and expense in energy.

6. If there is a school or if there are lecture-rooms for large bodies of students, they should also be centrally located because often the material to be used before the classes will come from many points in the institution, and the closer by these points are, the better it will be for patients. Of course, there will usually be small clinic-rooms for small numbers of students. located in the various units, where one or two patients can be examined at a time by half a dozen students under the direction of a demonstrator or clinician.

7. It will depend on many conditions whether there shall be one operating department located centrally, or whether there shall be a number of surgical operating-rooms, each one located at a point convenient to a particular class of patients; as, for instance, one operating-room in the children's department, one in the gynecologic department and often one in the obstetric department; and in the large institutions there is also a genito-urinary department, for many surgical cases of this class are highly infectious. There is much surgical work to do even in the obstetric department—cesarean sections, pubiotomies and the ordinary post-partum repair work. In tuberculosis some of the most satisfactory treatment is now surgical; in tuberculosis of the bones and joints, for instance, and in active tuberculous processes in the intestines or pleura. There is often a certain amount of brain-work that can be done for tuberculous patients nowadays. In fact almost every department of the hospital supplies its quota to the surgical operating-rooms. The medical profession is not

agreed for or against a centralized operating-plant. The cost of administration when the plant is divided into an operating-room for each class of patients is exceedingly high. Nurses and interns must be kept on duty whether or not there is work to be done. The apartments must be maintained in an aseptic and scrupulously clean condition, which takes a vast amount of work compared with the small amount of operating. Some physicians insist that it will not do to bring venereal cases into an operating-suite in which clean surgery is done and in which gynecologic cases are infected on their admission; some general surgeons object to having these cases brought into clean quarters. On the other hand, the advocates of a central operating-plant insist that no case should ever be brought to any operating-room until it is surgically clean and that the vilest venereal operation may be quite as clean as the operation for a ruptured appendix. Eventually the surgeons and medical staff of the institutions will probably be called on to determine whether their operating department may be centrally located in the interest of economy and efficiency as a whole, or whether they prefer to take the hazards incident to a large number of operating units located at widely different points and perhaps maintained under less careful supervision than would be the case in a central plant. It seems to be admitted that prompt, quick and careful transportation of patients even over considerable distances, as, for instance, from one building to another, is not trying on the patients and is not hazardous, as a rule, and in some places recovery-rooms are employed to hold patients until they are in a condition to be moved back safely from the operating-rooms to their own beds.

I have now pretty exhaustively covered the group of units that I think should be located in a central area, easily reached from all parts of the institution. The transportation for everything in connection with this layout can be done through well-lighted and well-ventilated tunnels underground, running through the basement of each building, and these tunnels can also be used for carrying the pipes for the physical service of the whole institution. The tunnel, for instance, can be 16 feet wide by 7 feet high. Nine feet of this tunnel can be used for passenger and freight service and a separate wall can be built up to separate the pipe tunnel from the other structure. The whole tunnel can be made of reinforced concrete, including the dividing wall and the roof. On each side of the pipe tunnel hooks or hangers can be placed, and if 2 feet on each side of this tunnel are taken for pipes, 4 feet will be left for a passage and workway, and this tunnel will contain all necessary pipes for heating, refrigeration, hot and cold water, electric conduits, etc., that are necessary for institution service. Arranged in this way they are easily accessible for repairs, or renewals or any changes that may be required. The passenger and freight part of the tunnel need not be elaborate. A solid concrete floor with smooth finish can be made to answer every purpose, although terrazzo or some of the monolithic or tile floors add to the appearance of the tunnel. The walls can be waterproof cement, white enameled, with a glazed finish, or they can be made of vitrified glazed tile, which is far costlier. The roof can be made of waterproof cement with a glazed finish, white enameled, or treated in any other desired way. Ventilation can be had by air-ducts at intervals, or the whole tunnel can be ventilated by running a shaft into the general ventilating shaft of the institution or by allowing the top of the tunnel to be a few feet above ground with small transom windows for both air and light.

If this general plan is carried out, elevators will be necessary in every building which communicates with the tunnel and is intended to be a part of the general service, but automatic, electric and hydraulic elevators are being made so efficient at present, (and "fool-proof") that they can be regarded as perfectly reliable. Although the cost of installation is a little higher than that of the man-operated elevators, the up-keep is low, as they do not require an elevator man to each car.

There are certain administrative units that will not be required as a part of this central area.

1. The mechanics or transmission of water, steam and electricity are so efficient that the refrigeration, ventilation and steam and electric service of the institution can be conveyed over considerable distances with comparatively little loss of efficiency. If the steam and refrigeration pipes are well covered, and if the electric service is well insulated and the whole transmission system is well installed, there is no good reason why the power-plant should not be located at the outskirts of the land area of the institution where the noise of the

machinery and the smoke and dirt will not interfere with the established order of things in the institution proper.

2. The laundry is in reality a part of the power-plant of the institution. It requires immense quantities of hot water and live steam. It deals with complicated mechanism that should be under the control, operation and guardianship of the engineering department. The laundry should therefore be immediately adjoining, or a part of the same building with, the power-plant and there is no good reason why this should not be the case. It is not very much trouble and takes very little time to transport a cart of soiled linen three hundred feet more or less, or even a quarter of a mile, because large loads can be hauled. An ordinary depot truck with rubber tires and electric motor can be used for the purpose if desired. These are made most efficient now and are in use in all the large depots of the country. They move rapidly, pull large loads and are easily handled. Automatic elevator service can be employed if necessary to locate the laundry over the power-plant and excellent administration technic can be employed for the handling of soiled material into the laundry and clean material back into the building through the tunnel. In most institutions heavy canvas bags, which prevent the spread of infections, are used for the soiled linens and these serve to save the goods from rough handling at the hands of the help. Even the linen-rooms can be located in the laundry if desired, and there is no particular reason why they should not be.

3. The incinerators for garbage from the kitchen suite, which will be vastly greater in quantity than the refuse from any other single unit, can be destroyed either in the fires of the power-plant or in an incinerator near by which will feed its smoke into the regular power-plant used. In most large institutions incinerators are being installed in the walls of the slop sink-rooms of the various units, for the destruction of garbage, dressings, etc., from those units. This system of destroying garbage in the various units will grow in favor and will come finally to be universal if the makers of these mechanical contrivances can devise a plan that will not render their use too costly in gas consumption.